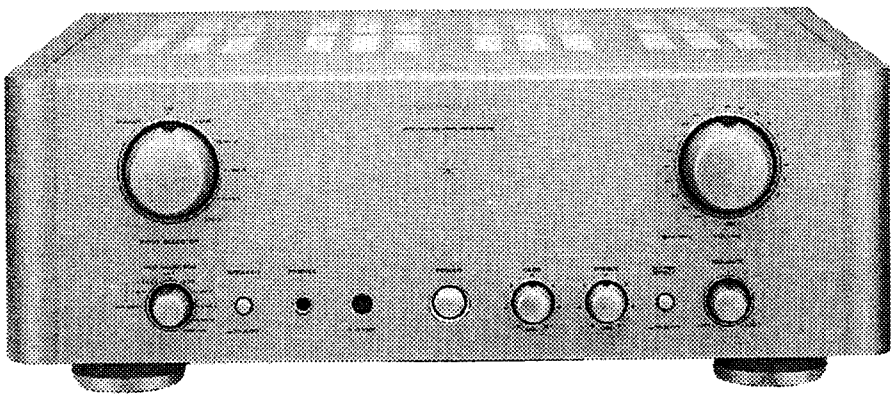
Service Manual

74 PM16/02B/02G
PM-16FN
Integrated amplifier



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Please use this service manual with referring to the guide (D.F.U.) without fall.

修理の際は、必ず取扱説明書を準備し操作方法を確認の上作業を行ってください。

marantz®

model PM-16

4822 725 51109

First issue : 1996/1

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CS 86 650

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

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MARANTZ AMERICA, INC.
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SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard NO.1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

1．規　格

定格出力
（20 Hz～20 kHz 両 ch 同時駆動）..... 90 W × 2（8 Ω負荷）
120 W × 2（6 Ω負荷）
150 W × 2（4 Ω負荷）

全高調波歪率
（20 Hz～20 kHz、両 ch 駆動、8 Ω負荷）..... 0.008 %
混変調歪率（SMPTE）..... 0.008 %
出力帯域幅（8 Ω負荷、0.03 %）..... 10 Hz～50 kHz
周波数特性
（CD、ソースダイレクト）..... 5 Hz～70 kHz $^{+0}_{-1}$dB
ダンピングファクター（8 Ω負荷、20 Hz～10 kHz）..... 160
入力感度／入力インピーダンス
PHONO（MC）..... 200 μ V/100 Ω
PHONO（MM）..... 2.5 mV/47 k Ω
HIGH LEVEL ..... 150 mV/10 k Ω

PHONO 最大許容入力（1 kHz）
MC ..... 12 mV
MM ..... 160 mV

RIAA 偏差（20 Hz～20 kHz）..... ± 0.2 dB

S/N 比（IHF A ネットワーク、入力ショート）
PHONO（MC）..... 76 dB
PHONO（MM）..... 90 dB
HIGH LEVEL ..... 111 dB

トーンコントロール
BASS（100 Hz）..... ± 8 dB
TREBLE（10 kHz）..... ± 8 dB

電源電圧 ..... AC 100 V、50 Hz/60 Hz
消費電力（電気用品取締法）..... 230 W
最大外形寸法
幅 ..... 458 mm
高さ ..... 167 mm
奥行き ..... 474 mm
重　量 ..... 20.0 kg

付属品
リモートコントロール送信機（RMC-16PM）..... 1
外形寸法
幅 ..... 45 mm
高さ ..... 136 mm
厚さ ..... 18 mm
重量 ..... 40 g
単三電池（SUM-3）..... 2

本機の規格および外観は改良のため予告なく変更することがありますが、ご了承ください。

1. SPECIFICATIONS

Rated output (20 Hz~20 kHz, both channels driven simultaneously) ..... 90 W X 2 (8 Ω load)
120 W X 2 (6 Ω load)
150 W X 2 (4 Ω load)

Total harmonic distortion
(20 Hz~20 kHz, both channels driven, 8 Ω load) ..... 0.008 %
Inter-modulation distortion (SMPTE) ..... 0.008 %
Output bandwidth (8 Ω load, 0.03 %) ..... 10 Hz ~ 50 kHz
Frequency response
(CD, source direct) ..... 5 Hz ~ 70 kH $^{+0}_{-1}$dB
Damping factor (8 Ω load, 20 Hz ~ 10 kHz) 160
Input sensitivity/input impedance
PHONO (MC) ..... 200 μV/100 Ω
PHONO (MM) ..... 2.5 mV/47 kΩ
HIGH LEVEL ..... 150 mV/10 kΩ

PHONO maximum allowable input (1 kHz)
MC ..... 12 mV
MM ..... 160 mV

RIAA deviation (20 Hz ~ 20 kHz) ..... ± 0.2 dB

Signal-to-noise ratio (IHF A network, short input)
PHONO (MC) ..... 76 dB
PHONO (MM) ..... 90 dB
HIGH LEVEL ..... 111 dB

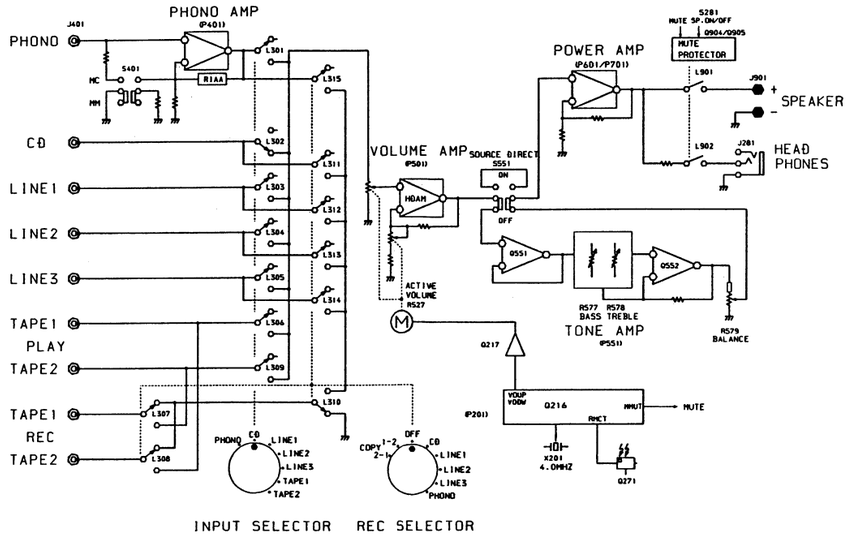
Tone control
BASS (100 Hz) ..... ± 8 dB
TREBLE (10 kHZ) ..... ± 8 dB

Power requirements ..... 230 V AC, 50 Hz
Power consumption ..... 230 W
Maximum outer dimensions
Width ..... 458 mm
Height ..... 167 mm
Depth ..... 474 mm
Weight ..... 20.0 kg

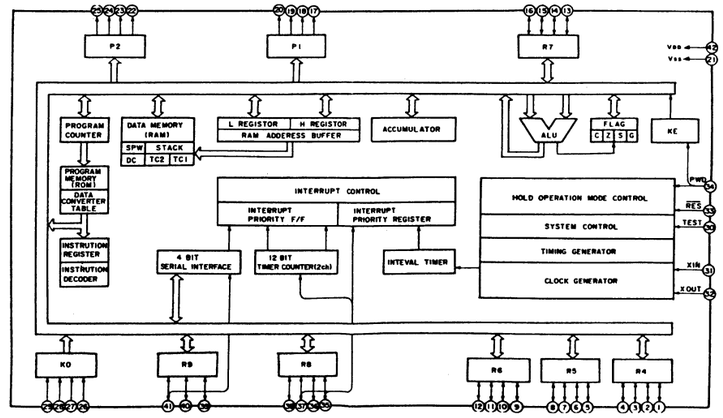
Accessories
Remote control unit (RMC-16PM) 1
Outer dimensions
Width ..... 45 mm
Height ..... 136 mm
Depth ..... 18 mm
Weight ..... 40 g
AA (R6) Batteries 2

Design and specifications subject to change without notice.

2．ブロックダイアグラム
BLOCK DIAGRAM



MICROPROCESSOR
QU01 : TMP47C200BN

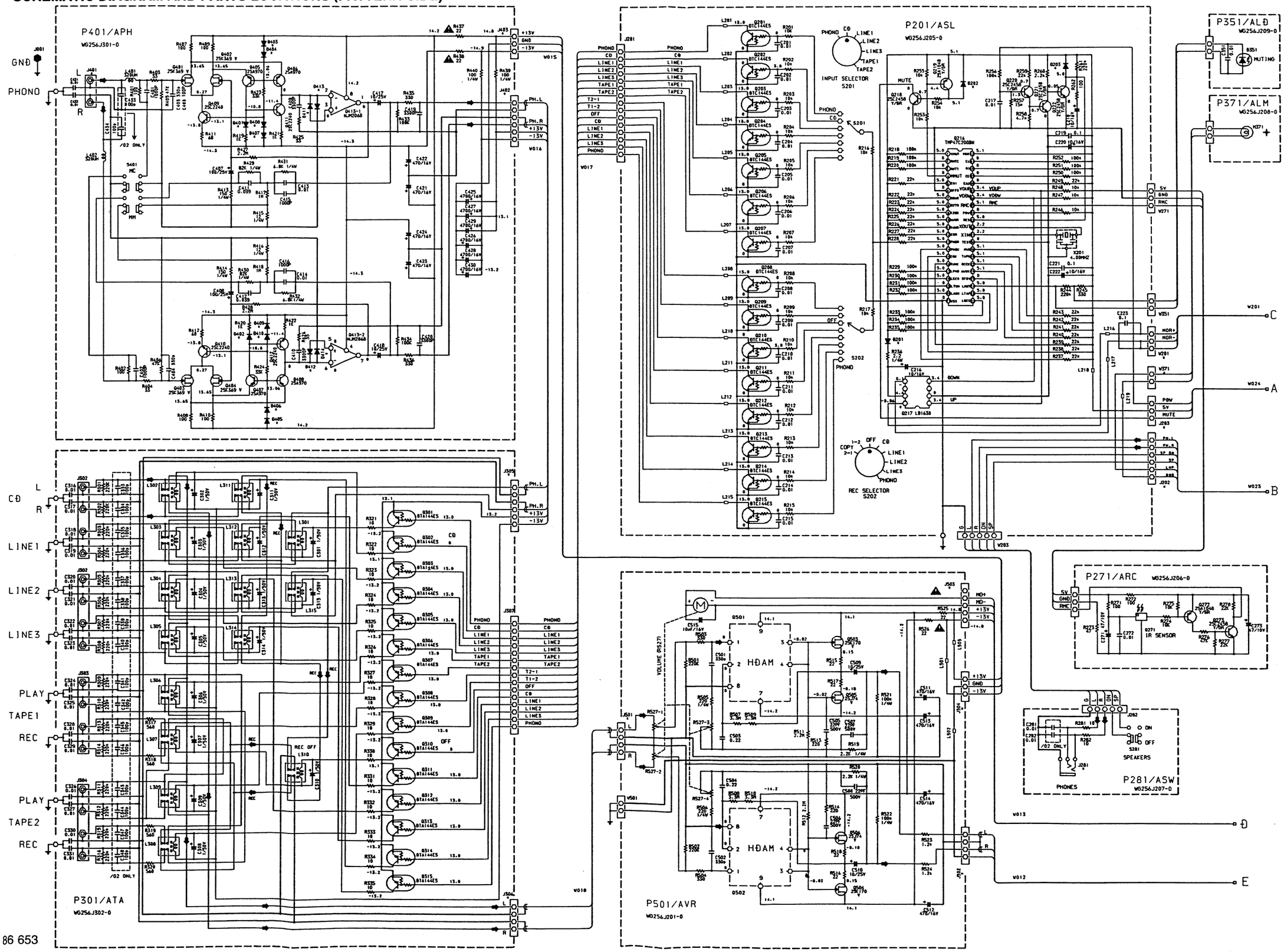


PIN NO.	PORT NAME		I/O	ACT	FUNCTION
1	R40	KMUT	O	L	SOURCE MUTE
2	R41	RMTC	O	L	TAPE OUT MUTE FOR DCC
3	R42	RMTT	O	L	TAPE OUT MUTE FOR TAPE
4	R43	MMUT	O	H	SPEAKER OUT MUTE
5	R50	EN1	I	–	MODEL SELECT #1
6	R51	OFFR	I	L	RECORDING OUT OFF
7	R52	SOUR	I	L	RECORDING OUT SOURCE
8	R53	D2TR	I	L	RECORDING OUT COPY DCC→TAPE
9	R60	T2DR	I	L	RECORDING OUT COPY TAPE→DCC
10	R61	AUXR	I	L	RECORDING OUT AUX
11	R62	TUNR	I	L	RECORDING OUT TUNER
12	R63	CDR	I	L	RECORDING OUT CD
13	R70	PHOR	I	L	RECORDING OUT PHONO
14	R71	PHOK	I	L	KEY INPUT PHONO
15	R72	CDK	I	L	KEY INPUT CD
16	R73	TUNK	I	L	KEY INPUT TUNER
17	P10	LPHO	O	L	LED INDICATOR PHONO
18	P11	LECD	O	L	LED INDICATOR CD
19	P12	LTUN	O	L	LED INDICATOR TUNER
20	P13	LAUX	O	L	LED INDICATOR AUX
21	VSS	VSS	–	–	GND

PIN NO.	PORT NAME		I/O	ACT	FUNCTION
22	P20	LDCC	O	L	LED INDICATOR DCC
23	P21	LTAP	O	L	LED INDICATOR TAPE
24	P22	LMUT	O	L	LED INDICATOR MUTE
25	P23	STBY	O	H	STAND-BY OTHER CONTROL
26	K00	AUXK	I	L	KEY INPUT AUX
27	K01	DCCK	I	L	KEY INPUT DCC
28	K02	TAPK	I	L	KEY INPUT TAPE
29	K03	MUK	I	L	KEY INPUT MANUAL MUTE
30	TEST	TEST	–	–	NOT USED (GND)
31	XIN	XIN	–	–	CLOCK 4.00 MHz
32	XOUT	XOUT	–	–	
33	$\overline{\text{RESET}}$	RES	I	L	SYSTEM RESET
34	$\overline{\text{HOLD}}$	PDW	I	L	POWER DOWN CHECK
35	R80	RMC	I	L	REMOTE CONTROL (RC-5) INPUT
36	R81	VODW	O	L	VOLUME CONTROL (DOWN)
37	R82	VOUP	O	L	VOLUME CONTROL (UP)
38	R83	EN2	I	–	MODEL SELECT #2
39	R90	CE	O	H	SERIAL OUTPUT (ENABLE)
40	R91	DL	O	H	SERIAL OUTPUT (DATA)
41	R92	CL	O	H	SERIAL OUTPUT (CLOCK)
42	VDD	VDD	–	–	POWER SUPPLY +5.4V

3．回路図と基板図（パターン側）

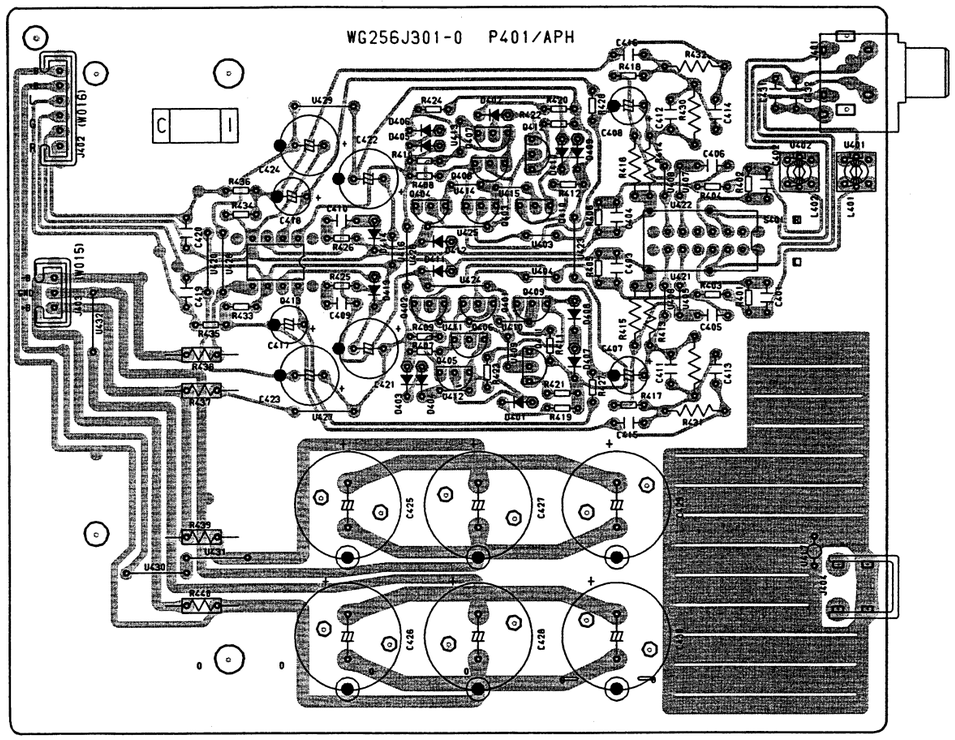
SCHEMATIC DIAGRAM AND PARTS LOCATIONS (PATTERN SIDE)



PCS 86 653

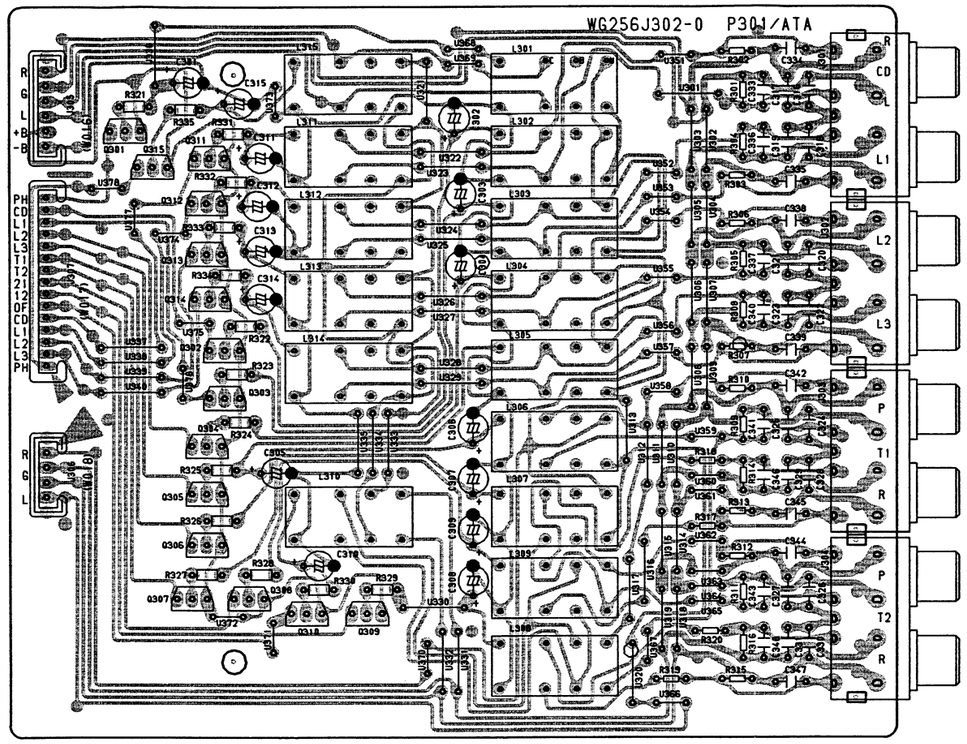
P401

Q407,Q408 Q412
Q413 Q401~Q404 Q409,Q410
Q405,Q406 Q411



P301

Q301,Q315
Q311~Q314
Q302~Q307 Q308,Q310 Q309



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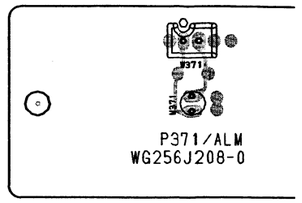

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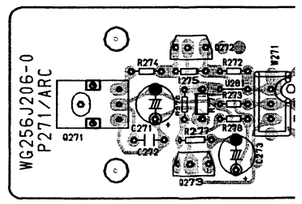

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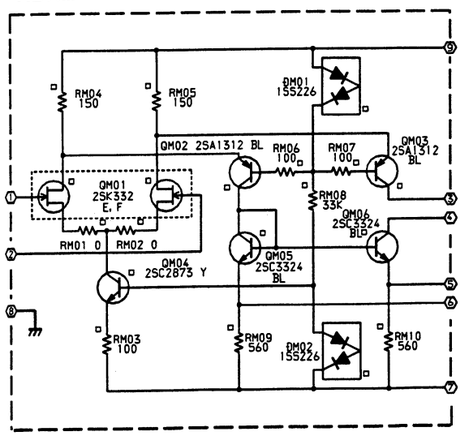

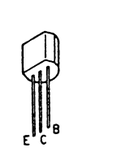

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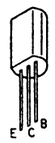
2SA970(GR,BL)



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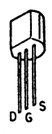

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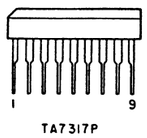

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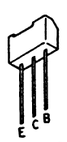

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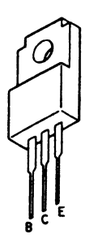

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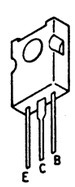

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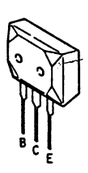

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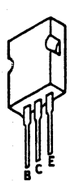

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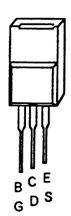

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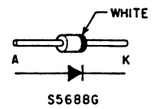

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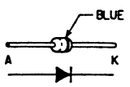

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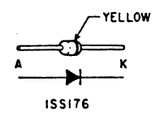

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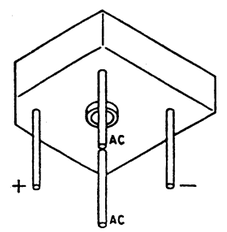

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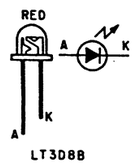
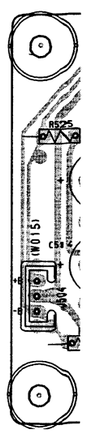


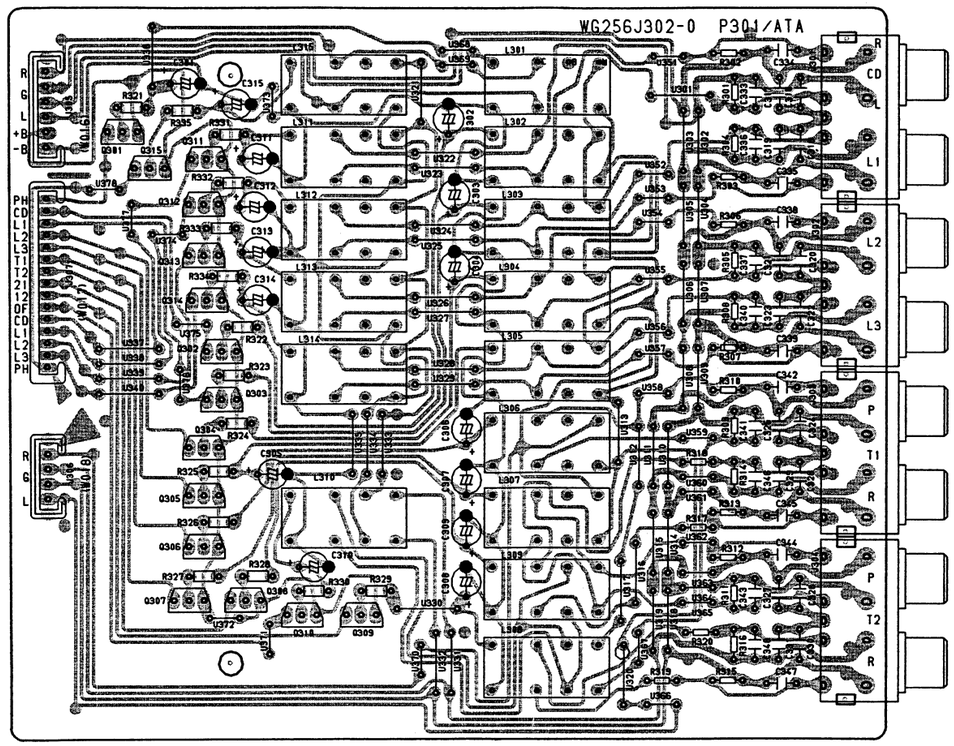
LT3D8B

P501



P301

Q301,Q315
Q311~Q314
Q302~Q307 Q308,Q310 Q309



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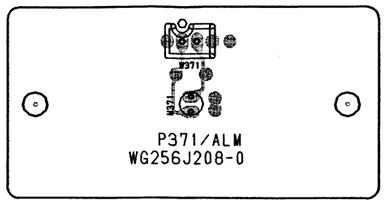

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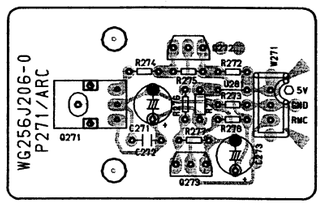
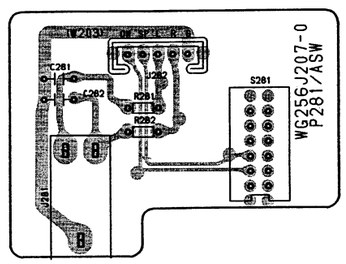
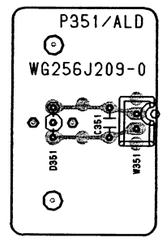


P281

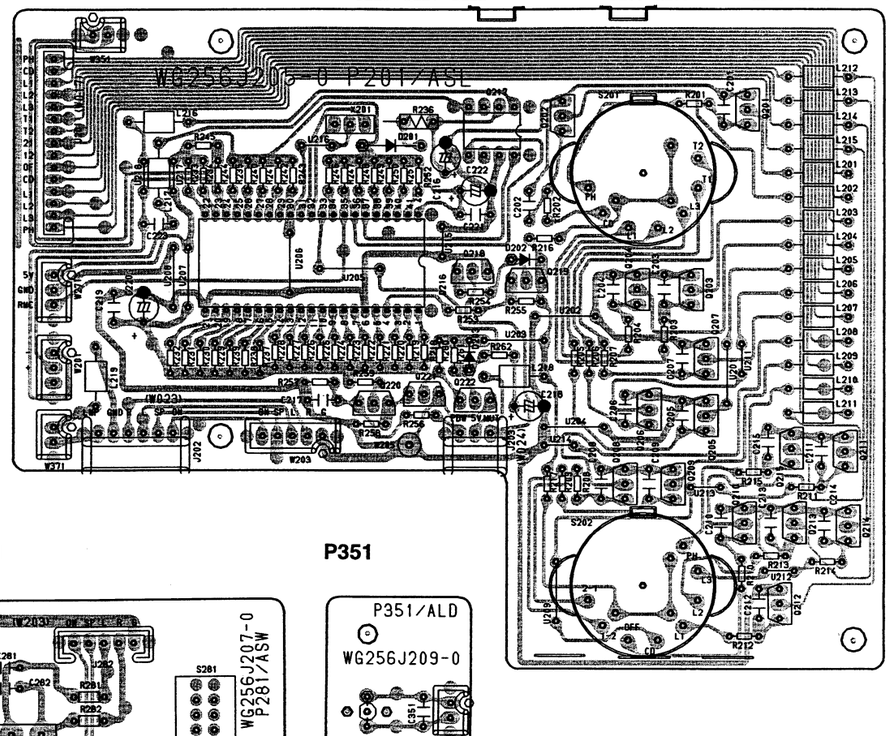


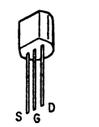
P351



P201

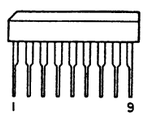
Q217 Q202 Q201
Q216 Q218 Q219 Q203~Q207
Q220 Q221 Q222 Q208 Q209 Q210~Q215



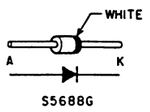


2SK246(GR)

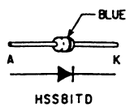
DTA144ES
DTC144ES
2SA1048
2SC2458



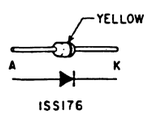
TA7317P



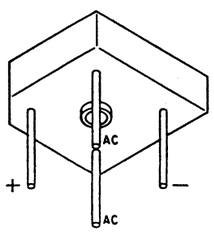
S5688G



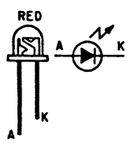
HSS81TD



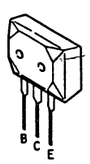
ISS176



S10VB-20



LT3D8B



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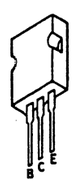
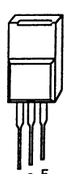
2SC2922



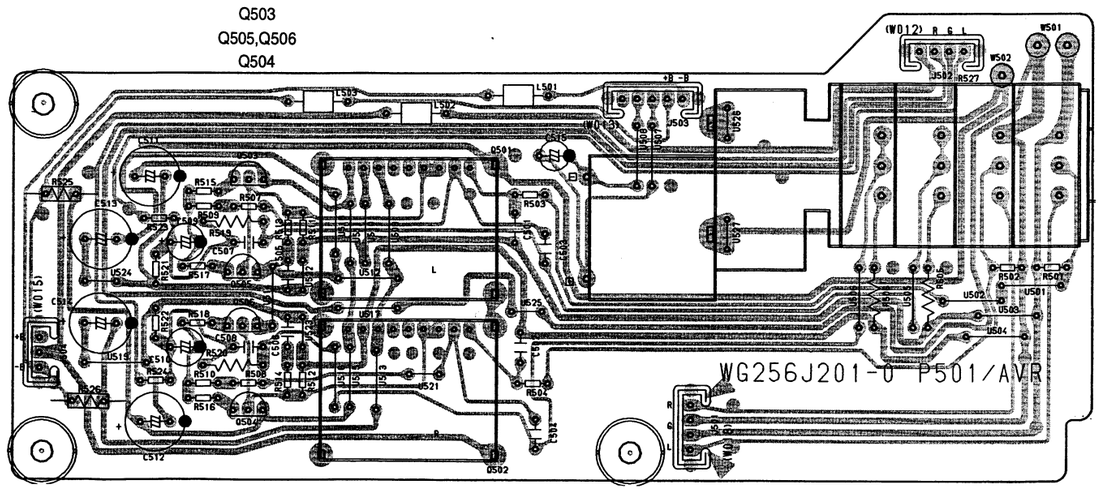
2SB1353(E)
2SD2033(E)



2SA1837
2SC4793
2SJ313
2SK2013

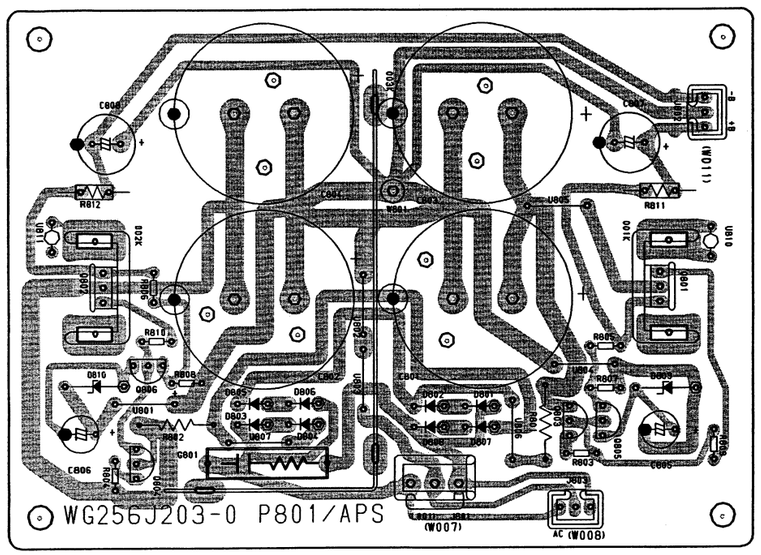
P501

Q503
Q505,Q506
Q504

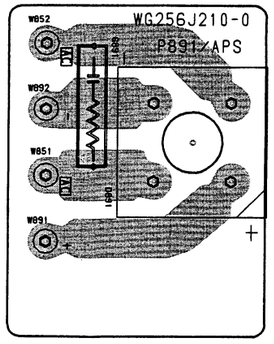


P801

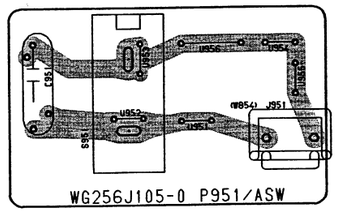
Q802
Q806,Q804
Q801
Q803,Q805



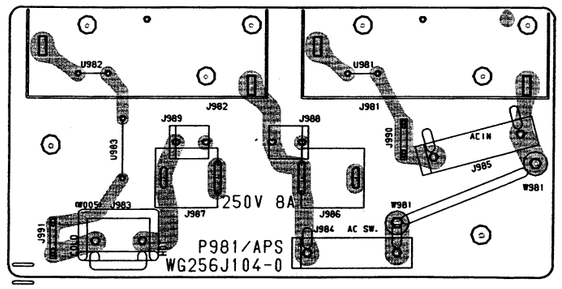
P891



P951

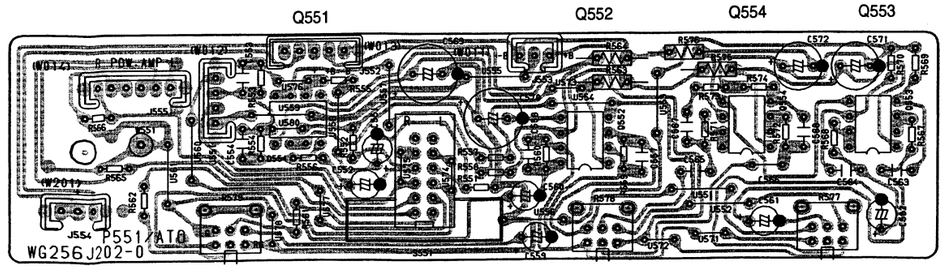


P981



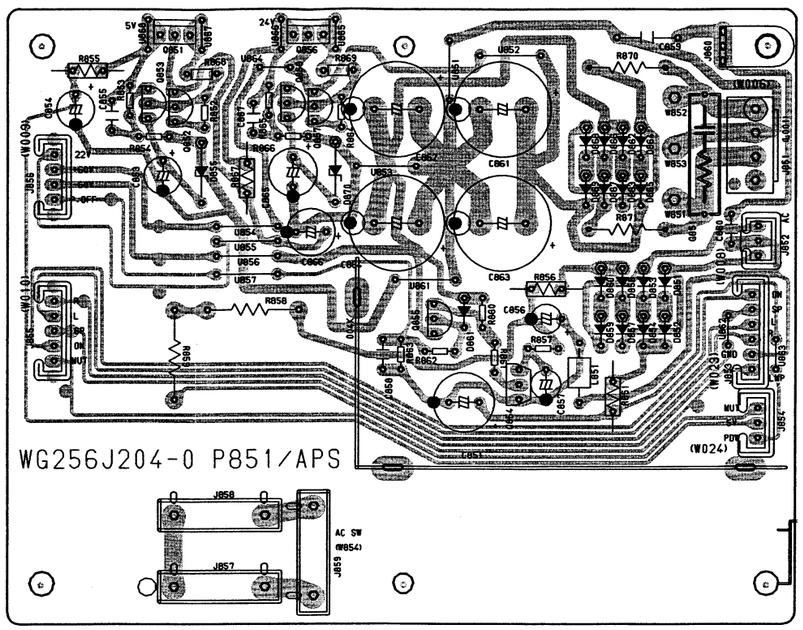
P551

Q551
Q552
Q554
Q553



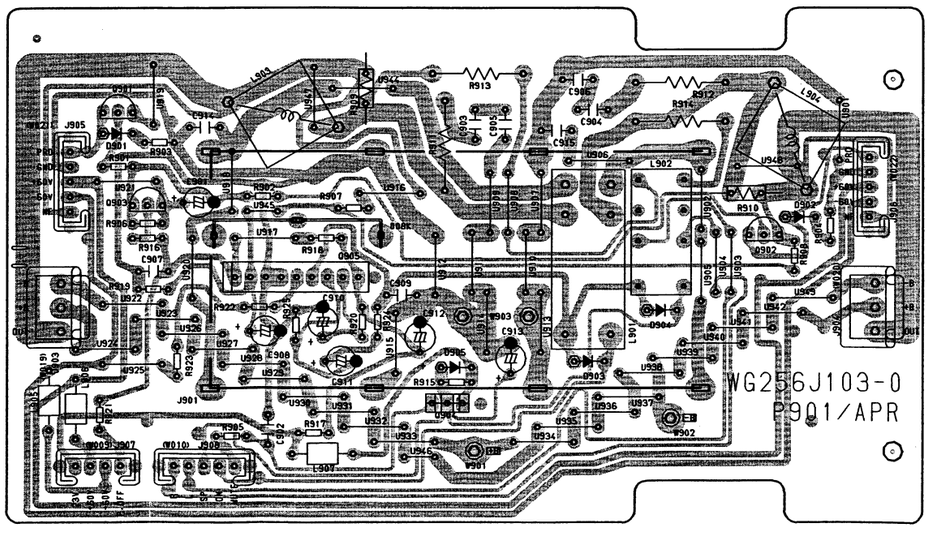
P851

Q851~Q853
Q856~Q858
Q855
Q854



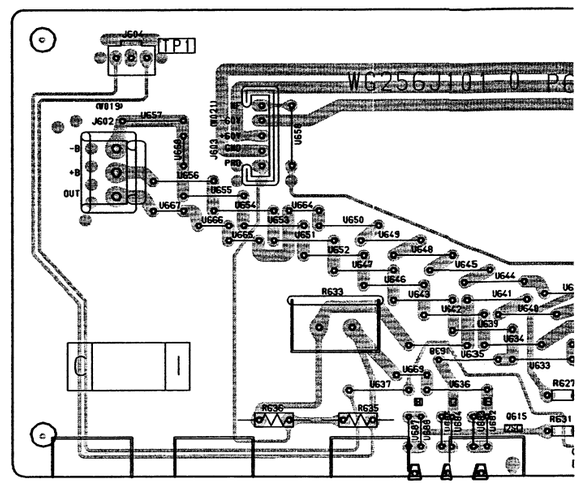
P901

Q901
Q903
Q905
Q902
Q904



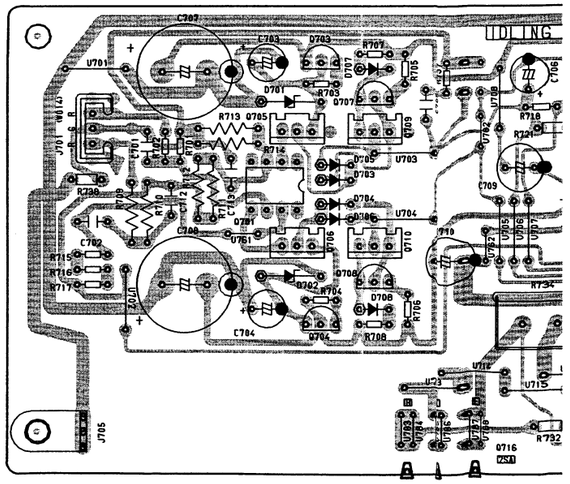
P601 POWER AMP L CH

Q615

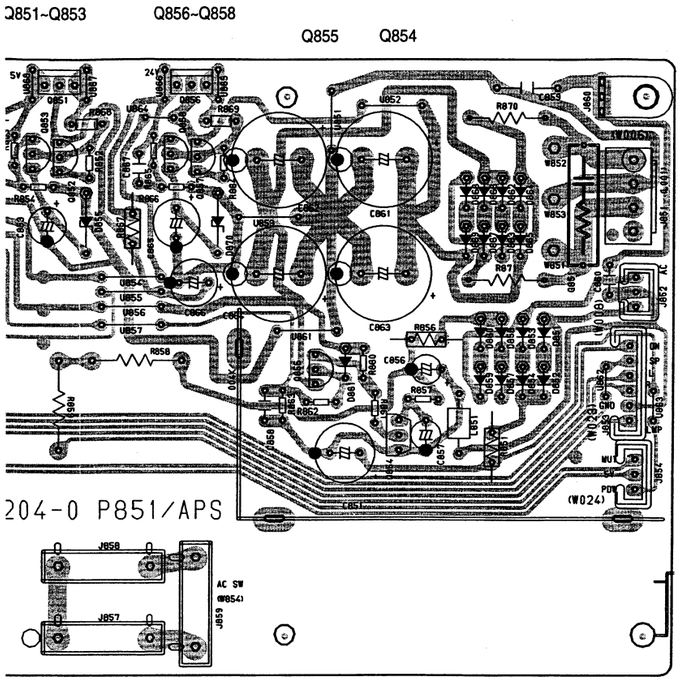


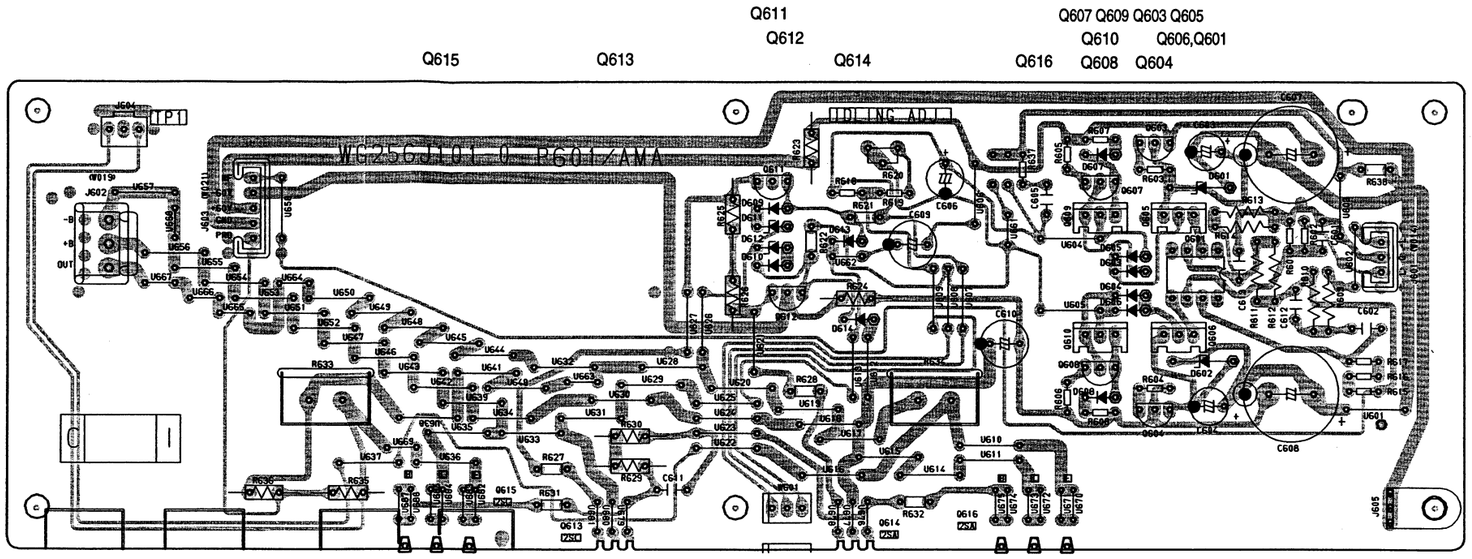
P701 POWER AMP R CH

Q705,Q703,Q707,Q709
Q701,Q706,Q710,Q708
Q704
Q716

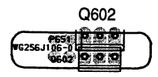


P601 POWER AMP L CH

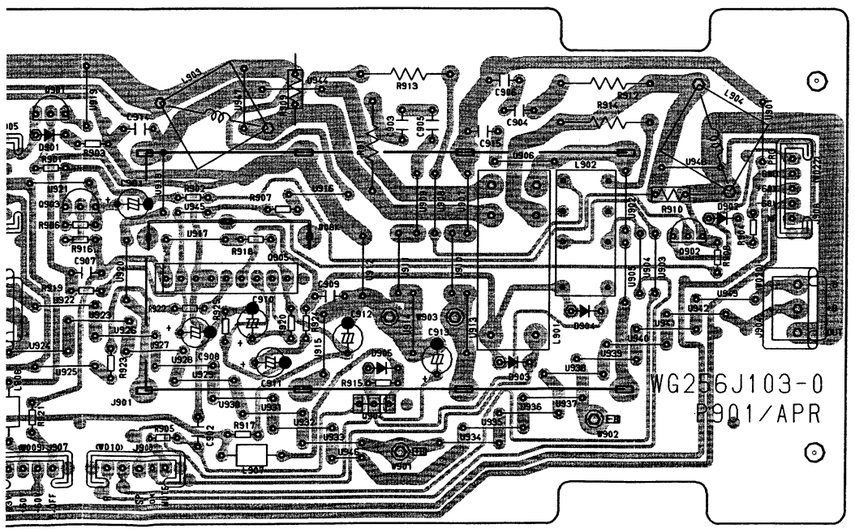


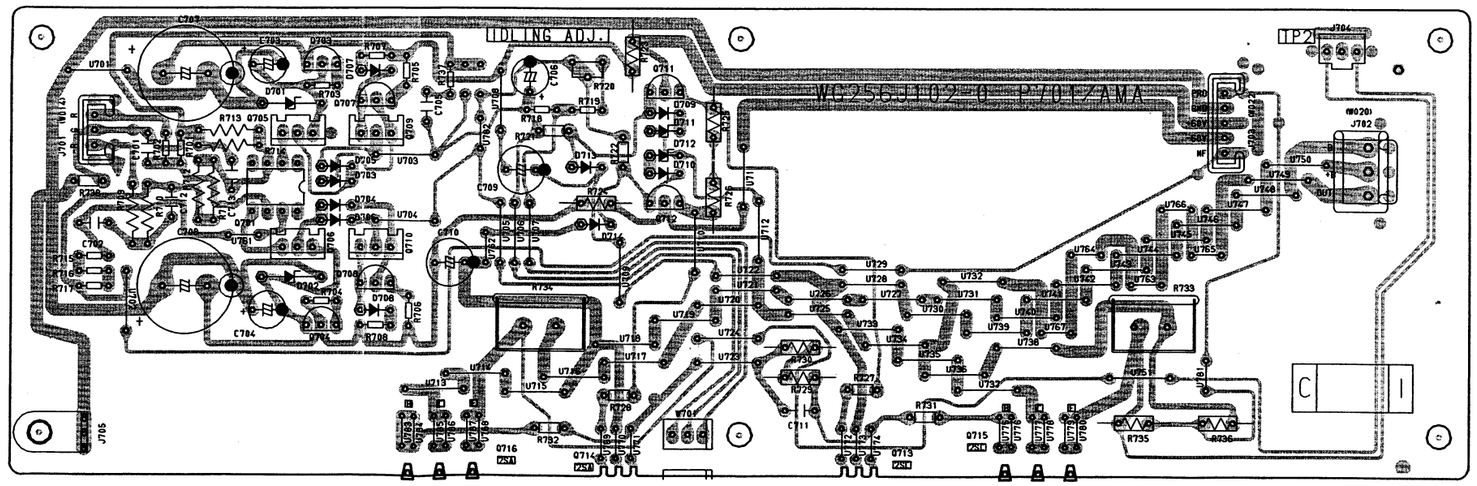


P651

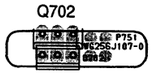


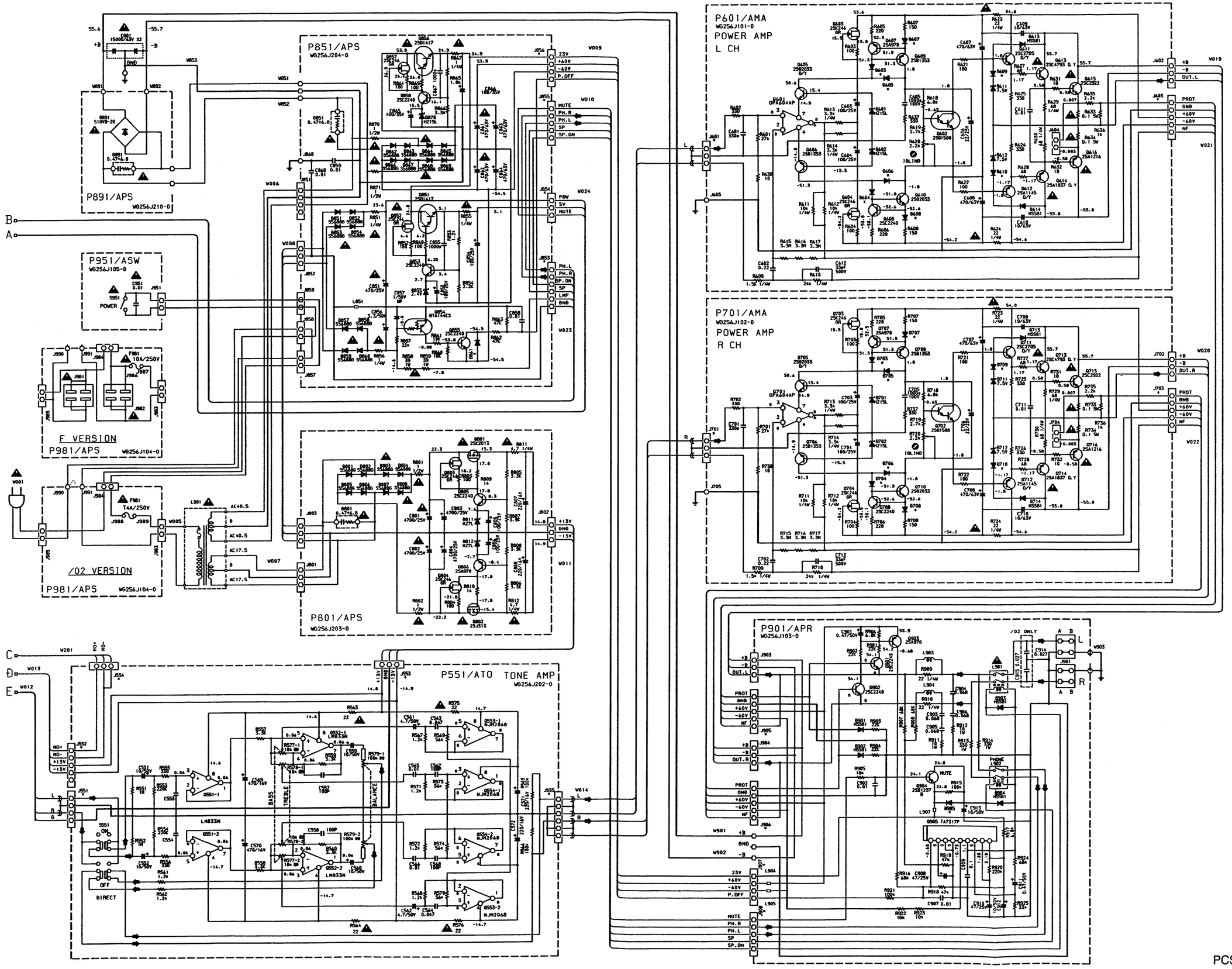
P701 POWER AMP R CH



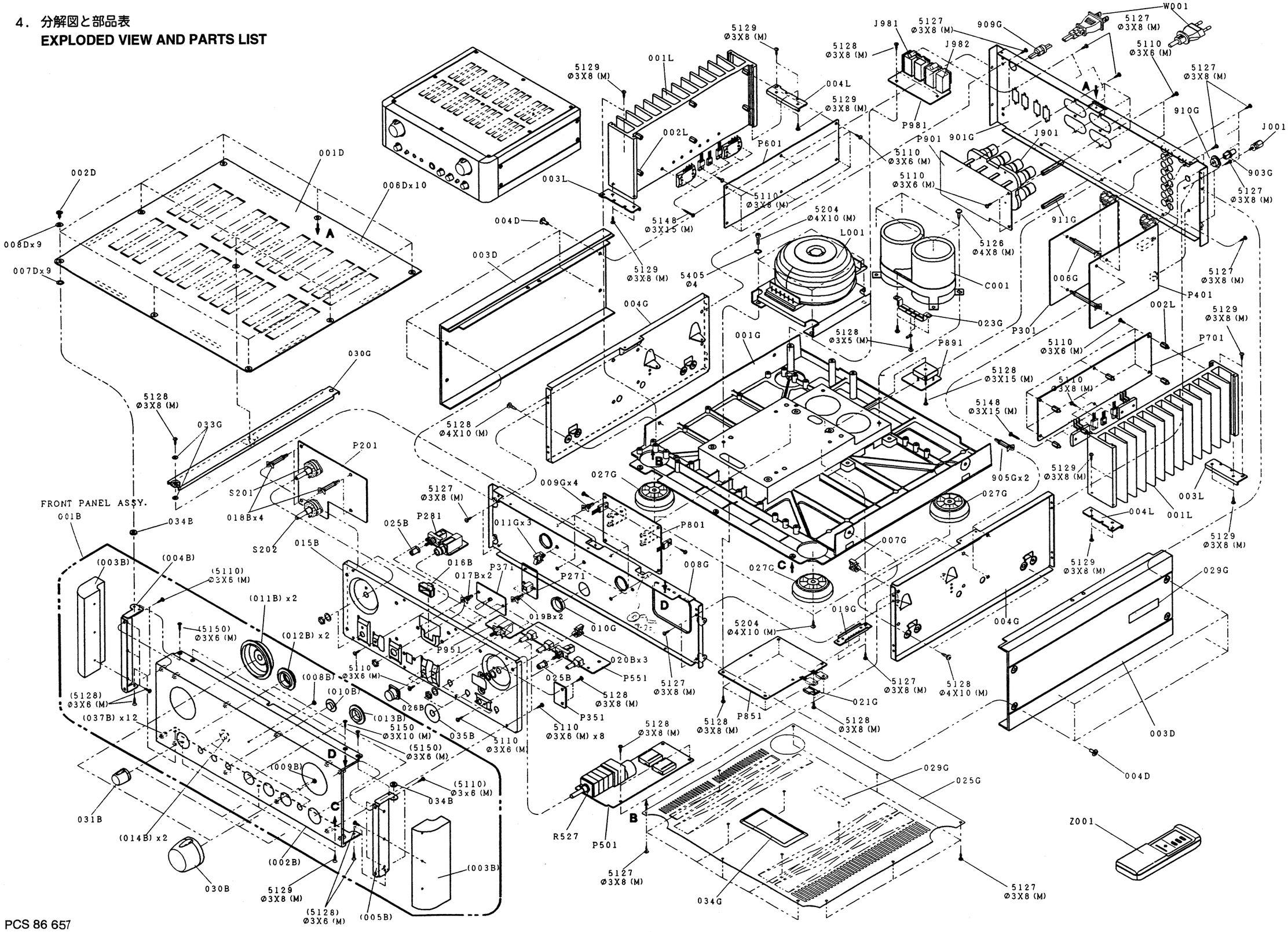


P751




P851/APS
WG256J204-0
P891/APS
WG256J210-0
P951/ASW
WG256J105-0
F VERSION
P981/APS
WG256J104-0
/02 VERSION
P981/APS
WG256J104-0
P801/APS
WG256J203-0
P601/AMA
WG256J101-0
POWER AMP
L CH
P701/AMA
WG256J102-0
POWER AMP
R CH
P901/APR
WG256J103-0
P551/ATO TONE AMP
WG256J202-0
LM833N
TA73179
/02 ONLY
PCS 86 65

4．分解図と部品表
EXPLODED VIEW AND PARTS LIST



PCS 86 657

MARA-00646 / DRUCK4

{VERS. :VERSION, U:U.S.A, F:Japan, K:Far East, /XX:Europe}

POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
001A			BUSHIN, GSPK.TERMINAL CAP	227J259010
001B	F		FRONT PANEL ASSY (GOLD)	256J248500
002B	/02G, F	4822 459 04074	FRONT PANEL (GOLD)	256J248010
002B	/02B	4822 459 04075	FRONT PANEL (BLACK)	256J248110
003B	/02G, F	4822 426 10074	ESCUTCHEON (GOLD)	256J063010
003B	/02B	4822 426 10075	ESCUTCHEON (BLACK)	256J063110
008B		4822 381 10841	LENS, POWER	238H355010
009B		4822 381 11677	LENS, MUTING	230K355020
010B	/02G, F	4822 381 11678	LENS, IR SENSOR (GOLD)	256J355010
010B	/02B		LENS, IR SENSOR (BLACK)	256J355020
011B	/02G, F		BUSHING, MAS VOL./INPUT SEL.G	256J259010
011B	/02B		BUSHING, MAS VOL./INPUT SEL.B	256J259110
012B	/02G, F		BUSHING, BAL./REC SEL.(GOLD)	256J259020
012B	/02B		BUSHING, BAL./REC SEL.(BLACK)	256J259120
013B	/02G, F		BUSHING, POWER (GOLD)	256J259030
013B	/02B		BUSHING, POWER (BLACK)	256J259130
014B	/02G, F		BUSHING, SPEAKER/S.DIRECT G	256J259040
014B	/02B		BUSHING, SPEAKER/S.DIRECT B	256J259140
025B	/02G, F	4822 410 63898	BUTTON, SPEAKER/S.DIRECT G	144J270010
025B	/02B	4822 410 10227	BUTTON, SPEAKER/S.DIRECT B	144J270110
026B	/02G, F	4822 410 10226	BUTTON, POWER SWITCH GOLD	231J270510
026B	/02B	4822 410 10228	BUTTON, POWER SWITCH BLACK	231J270520
027B	/02G, F		BUTTON, (GOLD)	231J270010
027B	/02B	4822 410 10229	BUTTON, (BLACK)	231J270110
028B		4822 410 10231	BUTTON, (MOLD)	270K270070
030B	/02G, F	4822 410 10232	KNOB, MAS VOL./INPUT SEL.	256J154010
030B	/02B	4822 410 10233	KNOB, MAS VOL./INPUT SEL.	256J154110
031B	/02G, F	4822 410 10234	KNOB, BAL/TONE/REC SEL.	256J154020
031B	/02B	4822 410 10235	KNOB, BAL/TONE/REC SEL.	256J154120
033B		4822 502 13315	B.T.SCREW(W/TL) FRONT PANEL BOTTOM	51290308M0
034B			SPACER, BRACKET	430T118010
001D	/02G, F		LID, TOP LID (GOLD)	256J257010
001D	/02B		LID, TOP LID (BLACK)	256J257110
002D	/02G, F		SCREW, LID (GOLD)	323S010020
002D	/02B	4822 502 21693	SCREW, LID (BLACK)	323S010030
003D	/02G, F		SIDE, PANEL (GOLD)	256J249010
003D	/02B		SIDE, PANEL (BLACK)	256J249110
004D	/02G, F		SCREW, SIDE PANEL (GOLD)	258S010020
004D	/02B		SCREW, SIDE PANEL (BLACK)	258S010010
001F		4822 401 11351	CLAMPER, HLJ0999-01-480(CLANP FOR JACK)	214K005010
013G			H.HEAD BOLT S.F, POWER TRANS.	52040410M0
014G			B.T.SCREW(W/W), CHEMICON BLOCK	51260408M0
025G	F		LID, BOTTOM	391H257130
027G		4822 462 42134	LEG ,(GOLD)	291K057010
028G			H.HEAD BOLT S.F, LEG	52040410M0
032G			T.L. WASHER OR, POWER TRANS	54050400M0
903G		4822 410 60343	BUTTON, MM/MC SEL.SWITCH	058J270030
909G	F	4822 532 52145	BUSHING, CORD KF-51	1455259210
909G	/02	4822 325 50202	BUSHING, CORD SR-6P-4	1455259060
910G			BUSHING, MM/MC SELECTOR SWITCH	126J259010
005L			B.T.SCREW(W/TL), FOR BRACKET	51290308M0
008L			F.WASHER SCREW, FOR POWER TR	51480315M0
009L			B.T.SCREW(W/TL), HEAT SINK UNIT	51290308M0
⚠C001		4822 124 11503	ELECT 15000 µF 63V FOR AUDIO	EI15906330
J001			TERMINAL GLD GND TERMINAL W/M3 TAPTIGHT	YL03010300
⚠L001	F		POWER TRANSF, FOR F	TS42001010
⚠L001	/02	4822 146 10382	POWER TRANSF, FOR N	TS42001020
⚠W001	F		A.C.POWER, CORD 5A 125V MITI (OFC)	YC01800460
⚠W001	/02	4822 321 10804	A.C.POWER, CORD AC CODE CEE	YC01800480

POS. NO.	VERS. MODEL	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
			PACKING	
001S	F		PACKING CASE (GOLD)	256J801020
002S	F		CUSHION L/R	256J809010
003S	F		SHEET, MIRROR MAT FOR SET	181H107010
001T	F		USER MANUAL, PM-16(F)	256J851110
001T	/02	4822 736 14102	USER MANUAL, PM-16(N)	256J851310
002T	F		WARRANTY CARD, ENVELOPE FOR JAPAN	9631000220
003T	F		USER'S CARD	145J865110
Z001		4822 218 10639	UNIT K, COMMANDER RMC-16PM	ZK256J0010
Z002	F		BATTERY SUM-3	ZF23302000

PCS 86 658

5．サービスに必要な測定器
TEST EQUIPMENT REQUIRED FOR SERVICING

Item 項　　目	Use 使　　用　　方　　法
Distortion Analyzer 歪　　率　　計	Distortion measurements 歪　　の　　測　　定
Audio Oscillator 低 周 波 発 振 器	Sinewave and squarewave signal source 正 弦 波 及 び 矩 形 波 の 信 号 源
AC VTVM A C　　V T V M	Voltage measurements (AC) 交　　流　　電　　圧　　の　　測　　定
Oscilloscope オ ッ シ ロ ス コ ー プ	Waveform analysis and trouble shooting and ASO alignment 波計分析、トラブルシューティング及びＡＳＯの調整
DC VTVM D C　　V T V M	Voltage measurements (DC) 直　　流　　電　　圧　　の　　測　　定
AC Wattmeter 交流ワットメーター	Monitors primary power to amplifier アンプの一次側消費電力のモニター
Line Voltmeter 電 源 電 圧 計	Monitors potential of primary power to amplifier アンプの一次側消費電圧のモニター
Variable Autotransfomer ス ラ イ ダ ッ ク	Adjust level of primary power to amplifier アンプの一次側電圧の調節
Circuit Tester テ　　ス　　タ　　ー	Trouble shooting トラブルシューティング
Shorting Plug ショート用プラグ	Shorts amplifier input to eliminate noise pickup 雑音を拾わないようにアンプ入力を短絡する

6．アイドリング電流調整手順

(1) 電源を投入しない状態で、マスターボリュームを最小の位置にセッティングします。さらにプリント基板 P601 (L ch) 内の半固定抵抗 R620及び、R701 (R ch)内の半固定抵抗 R720を、それぞれ反時計方向に絞り切った状態にしておきます。

(2) プリント基板 P601 (L ch) 内のテストポイントコネクタ TP1: J604 の両端ピンに、直流電圧レンジとしたデジタルボルトメーターを接続します。プリント基板 P701 (R ch) 内のテストポイント TP1: J704 の両端ピンにも同様に直流電圧レンジとしたデジタルボルトメータを接続します。

(3) 以上の準備が完了した後に、電源を投入します。10分後にP601 (L ch) 内の半固定抵抗 R620と、P701 (R ch)内の半固定抵抗 R720をそれぞれ時計方向に回して、デジタルボルトメータの指示を見ながら調整します。設定値は L ch、R ch 共に10 mV (50 mA) です。

[注意]
電源電圧は AC 100V±1%で調整してください。

電源投入後経過時間	アイドリング電流調整値
30秒後～1分後	6 mV ～ 8 mV
1 分後～5 分後	8 mV ～ 9.5 mV
10分後	9.5 mV ～ 10 mV

(4) なお、ヒートラン及びエージング又は修理後のアイドリング調整は、約10分間無信号、無負荷で、電源投入状態で放置した後に、設定値が 10 mV (50 mA) になるように調整します。

6. IDLING CURRENT ADJUSTMENT

(1) Before switching the power ON, set the Master Volume Control to minimum position. Then, rotate the semi-fixed resistor R620 on the PC board P601 (L ch) and the semi-fixed resistor R720 on the PC board P701 (R ch) fully counterclockwise.

(2) Connect a digital voltmeter, set for DC voltage input, to the test point connector pin TP1: J604 on the PC board P601 (L ch).
Also connect the digital voltmeter, set for DC voltage input, to the test point connector pin TP1: J704 on the PC board P701 (R ch).

(3) After the completion of the above setup, switch the power ON, and after 10 minutes, adjust the semi-fixed resistor R620 on the PC board P601 (L ch) and the semi-fixed resistor R720 on the PC board R701 (R ch) according to the reading on the digital voltmeter by rotating each of them clockwise. Set the reading of the voltmeter for 10 mV (50 mA) on both L ch and R ch.

Note:
Be sure to perform this adjustment with the power supply AC voltage ±1%.

Elapsed time after power ON	Idling current setting value
30 sec. ~ 1 min.	6 mV ~ 8 mV
1min. ~ 5 min.	8 mV ~ 9.5 mV
More than 10 min.	9.5 mV ~ 10 mV

(4) In the idling adjustment after heat-running, aging test or repair, perform the adjustment after leaving the unit for approx. 10 minutes applying no signal and no load in power ON condition so that the setting value becomes 10 mV (50 mA).

7. 電気部品表 ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

R＊＊＊ : (1) GD05 x x x 140, Carbon film fixed resistor, ±5% 1/4W
R＊＊＊ : (2) GD05 x x x 160, Carbon film fixed resistor, ±5% 1/6W

① ——— Resistance value

Examples ;
① Resistance value

0.1 Ω.....001	10 Ω.....100	1 kΩ.....102	100 kΩ.....104
0.5 Ω.....005	18 Ω.....180	2.7 kΩ.....272	680 kΩ.....684
1 Ω.....010	100 Ω.....101	10 kΩ.....103	1 MΩ.....105
6.8 Ω.....068	390 Ω.....391	22 kΩ.....223	4.7 MΩ.....475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C＊＊＊ : CERAMIC CAP.
(1) DD1x x x x 370, Ceramic capacitor
Disc type
Temp. coeff. P350 ~ N1000, 50V
① ② Capacity value
Tolerance

Examples ;
① Tolerance (Capacity deviation)
± 0.25pF 0
± 0.5pF 1
± 5% 5
＊Tolerance of COMMON PARTS handled here are as follows :
0.5pF ~ 5pF ..... ±0.25pF
6pF ~ 10pF ..... ±0.5pF
12pF ~ 560pF ..... ±5%
② Capacity value

0.5 pF 005	3 pF 030	100 pF 101
1 pF 010	10 pF 100	220 pF 221
1.5 pF 015	47 pF 470	560 pF 561

C＊＊＊ : CERAMIC CAP.
(1) DK16 x x x 300, High dielectric constant ceramic capacitor
① Disc type
Temp. chara. 2B4, 50V
Capacity value

Examples ;
① Capacity value

100 pF.....101	1000 pF.....102	10000 pF 103
470 pF.....471	2200 pF.....222	

C＊＊＊ : ELECTROLY CAP. (⏚), FILM CAP. (⏤)
(1) EA x x x x x x 10, Electrolytic capacitor
One-way lead type, Tolerance ± 20%
① ② Working voltage
Capacity value

Examples ;
① Capacity value

0.1 µF.....104	4.7 µF.....475	100 µF.....107
0.33 µF.....334	10 µF.....106	330 µF.....337
1 µF.....105	22 µF.....226	1100 µF.....118
		2200 µF.....228

② Working voltage

6.3 V.....006	25 V.....025	
10 V.....010	35 V.....035	
16 V.....016	50 V.....050	

(2) DF15 x x x 350 → Plastic film capacitor
DF15 x x x 310 → One-way type, Mylar ± 5% 50V
DF16 x x x 310 → Plastic film capacitor
One-way type, Mylar ± 10% 50V
①
Capacity value

Examples ;
① Capacity value

0.001 µF (1000pF) 102	0.1 µF.....104
0.0018 µF 182	0.56 µF.....564
0.01 µF 103	1 µF.....105
0.015 µF 153	

NOTE : 1) The above CODES (R＊＊＊, R＊＊＊, C＊＊＊, C＊＊＊ and C＊＊＊) are omitted on the schematic diagram in some case.
2) On the occasion, be confirmed common parts on the parts list.
3) Refer to "Common Parts List" for the other common parts (**R105, DD4, DK4**).

NOTE ON SAFETY FOR FUSIBLE RESISTOR :

The suppliers and their type numbers of fusible resistors aer as follows ;

1. KOA Corporation

Part No.	Type No.	Description
NH05 x x x 140	→ RF25S x x x x Ω J	(± 5% 1/4W)
NH05 x x x 120	→ RF50S x x x x Ω J	(± 5% 1/2W)
NH85 x x x 110	→ RF73B2A x x x x Ω J	(± 5% 1/10W)
NH85 x x x 140	→ RF73B2E x x x x Ω J	(± 5% 1/4W)

＊ Resistance value — Resistance value (0.1 - 10kΩ)

2. Matsushita Electronic Components Co., Ltd

Part No.	Type No.	Description
NF05 x x x 140	→ ERD-2FCJ x x x	(± 5% 1/4W)
RF05 x x x 140		
NF02 x x x 140	→ ERD-2FCG x x x	(± 2% 1/4W)
RF02 x x x 140		

＊ Resistance value — ＊ Resistance value

Examples ;
＊ Resistance value

0.1 Ω.....001	10 Ω.....100	1 kΩ.....102	100 kΩ.....104
0.5 Ω.....005	18 Ω.....180	2.7 kΩ.....272	680 kΩ.....684
1 Ω.....010	100 Ω.....101	10 kΩ.....103	1 MΩ.....105
6.8 Ω.....068	390 Ω.....391	22 kΩ.....223	4.7 MΩ.....475

ABBREVIATION AND MARKS

1	ANT.	: ANTENNA	2	BATT.	: BATTERY
3	CAP.	: CAPACITOR	4	CER.	: CERAMIC
5	CONN.	: CONNECTING	6	DIG.	: DIGITAL
7	HP	: HEADPHONE	8	MIC.	: MICROPHONE
9	µ-PRO	: MICROPROCESSOR	10	REC.	: RECORDING
11	RES.	: RESISTOR	12	SPK	: SPEAKER
13	SW	: SWITCH	14	TRANSF.	: TRANSFORMER
15	TRIM.	: TRIMMING	16	TRS.	: TRANSISTOR
17	VAR.	: VARIABLE	18	X'TAL	: CRYSTAL
19			20		
21			22		
23			24		
25			26		
27			28		
29			30		

NOTE ON SAFETY :

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

安全上の注意：

⚠ がついている部品は、安全上重要な部品です。必ず指定されている部品番号の部品を使用して下さい。

[VERS. :VERSION, U:U.S.A, F:Japan, K:Far East, /XX:Europe]

POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
			P201-INPUT SEL.REC SEL. CIRCUIT BOARD	
			P201-CAPACITORS	
C201				
∫		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C215				
C216		4822 124 90352	ELECT. 0.010 µF 16V	OA10601620
C217		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C218		4822 124 90352	ELECT. 10 µF 16V	OA10601620
C219		4822 122 40617	CER. 0.1 µF +80%-20%	DD38104010
C220		4822 124 90352	ELECT. 10 µF 16V	OA10601620
C221		4822 122 40617	CER. 0.1 µF +80%-20%	DD38104010
C222		4822 124 90352	ELECT. 10 µF 16V	OA10601620
C223		4822 122 40617	CER. 0.1 µF +80%-20%	DD38104010
			P201-RESISTOR	
R236		4822 116 83963	2.2Ω ± 5% 1/4W	GG05022140
			P201-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R201~R235, R237~R262	
			P201-SEMICONDUCTORS	
D201		4822 130 32508	DIODE RL103E DSF10C	HD20003000
D202		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
D203		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
Q201				
∫		4822 130 42594	DIG.TRS DTC144ES	BA20012210
Q215				
Q216		4822 209 90571	MICROPROCESSOR 4BIT 2K TMP47C200BN-XXXX	HU257JT000
Q217		4822 209 73287	IC LB1630	HC10235030
Q218		4822 130 60839	TRS. 2SC2458 (Y OR G)	HT324582B0
Q219		4822 130 60107	TRS. 2SA1048 (Y OR G)	HT110482B0
Q220		4822 130 60839	TRS. 2SC2458 (Y OR G)	HT324582B0
Q221		4822 130 60839	TRS. 2SC2458 (Y OR G)	HT324582B0
Q222		4822 130 60839	TRS. 2SC2458 (Y OR G)	HT324582B0
			P201-MISCELLANEOUS	
J201		4822 267 31501	JACK B15B-PH-K-S	YJ06006350
J202			PLUG S6B-EH	YP06011860
J203			PLUG S3B-EH	YP06003930
L201				
∫		4822 158 60605	FERRITE BEADS(B-01-RT)	FC90050060
L219				
S201		4822 273 10302	ROTARY SWITCH SRRM 1-7 L30	SR01070020
S202		4822 273 10303	ROTARY SWITCH SRRM 1-8 L25	SR01080080
X201		4822 242 72527	SERAMIC VIB. CERALOCK CST4.00MGW	FQ04004030
			P271-IR SENSOR CIRCUIT BOARD	
			P271-CAPACITORS	
C271		4822 124 23563	ELECT 47 µF 10V	EG47601050
C272		4822 126 12496	CER. 0.01 µF +80% -20%	DD38103010
C273		4822 124 23563	ELECT 47 µF 10V	EG47601050
			P271-RESISTOR	
R271		4822 052 10101	100Ω ± 5% 1/6W	GG05101160
			P271-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R272~R278	
			P271-SEMICONDUCTORS	
Q271		4822 130 83519	PHOTO UNIT IR RECIVER RPM-670CBR H-15MM	HW10001210
Q272		4822 130 60107	TRS. 2SA1048 (Y OR GR)	HT110482B0
Q273		4822 130 60839	TRS. 2SC2458 (Y OR GR)	HT324582B0

POS. NO.	VERS. MODEL	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
			P281-SPK SW,HEAD PHONE CIRCUIT BOARD	
			P281-CAPACITORS	
C281	/02	4822 122 30043	CER. 0.01µF +80%-20% 50V	DK18103310
C282	/02	4822 122 30043	CER. 0.01 µF +80%-20% 50V	DK18103310
			P281-RESISTORS	
R281		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
R282		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
			P281-MISCELLANEOUS	
J281	/02G,F	4822 267 31692	JACK HEAD PHONE JACK GRAY	YJ01003880
J281	/02B	4822 267 31691	JACK ST HEADPHONE JACK BLK	YJ01003870
J282		4822 267 31698	PLUG B5B-EH 5P RADIAL TAPING	YP06010450
S281		4822 276 13065	PUSH SWITCH SPUP24V1A NON-SHORT	SP04010650
			P301-SELECTOR SW CIRCUIT BOARD	
			P301-CAPACITORS	
C301				
∫		4822 124 41543	ELECT. 0.01 µF 50V	OA10505020
C315				
C316				
∫		4822 122 30043	CER. 0.01 µF +80%-20% 50V	DK18103310
C331				
C333				
∫	/02	4822 121 70543	FILM 100PF ± 5%100V APSV	OF15101540
C348				
			P301-RESISTORS	
R321				
∫		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
R335				
			P301-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R301~R316, R317~R320	
			P301-SEMICONDUCTORS	
Q301				
∫		4822 130 42682	DIG.TRS DTA144ES	BA10010210
Q315				
			P301-MISCELLANEOUS	
J301				
∫		4822 290 81599	TERMINAL, 4P RCA JACK GOLD	YT02040970
J304				
L301				
∫		4822 280 10295	RELAY G5-2-H1 24V RELAY	LY20240450
L315				
			P351-MUTE LED CIRCUIT BOARD	
			P351-CAPACITOR	
C351		4822 126 12496	CER. 0.01 µF +80% -20%	DD38103010
			P351-SEMICONDUCTORS	
D351		4822 130 80326	L.E.D. LT3D8B RED 3O	HI10062320
			P371-LAMP CIRCUIT BOARD	
			P371-MISCELLANEOUS	
M371		4822 134 40925	LAMP 8V 100MA (DC IGN.) BLUE	IN10080680
			P401-PHONO AMP CIRCUIT BOARD	
			P401-CAPACITORS	
C401		4822 121 42861	FILM 0.001 µF ± 5% 50V	OF15102010
C402		4822 121 42861	FILM 0.001 µF ± 5% 50V	OF15102010
C403	F	4822 121 70543	FILM 100 PF ± 5% 100V APSV	OF15101540
C403	/02		FILM 330 PF ± 5%	OF15331540
C404	F	4822 121 70543	FILM 100 PF ± 5% 100V APSV	OF15101540
C404	/02		FILM 330 PF ± 5%	OF15331540
C407		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C408		4822 124 41535	ELECT. 100 µF 25V	OA10702520

[VERS. :VERSION, U:U.S.A, F:Japan, K:Far East, /XX:Europe]

POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
C409		4822 121 42762	FILM 0.0033 µF ± 5% 50V	OF15332010
C410		4822 121 42762	FILM 0.0033 µF ± 5% 50V	OF15332010
C411		4822 121 43133	FILM 0.039 µF ± 5% 50V	OF15393010
C412		4822 121 43133	FILM 0.039 µF ± 5% 50V	OF15393010
C413		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C414		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C415		4822 121 42861	FILM 0.001 µF ± 5% 50V	OF15102010
C416		4822 121 42861	FILM 0.001 µF ± 5% 50V	OF15102010
C417		4822 124 80578	ELECT. 22 µF 25V ARA	OA22602550
C418		4822 124 80578	ELECT. 22 µF 25V ARA	OA22602550
C419		4822 121 42762	FILM 3300 PF ± 5% 50V	OF15332010
C420		4822 121 42762	FILM 3300 PF ± 5% 50V	OF15332010
C421 § C424		4822 124 22277	ELECT. 470 µF 16V	OA47701620
C425 § C428		4822 124 80582	ELECT. 4700 µF 16V RA2	OA47801620
C429		4822 124 80582	ELECT. 4700 µF 16V RA2	OA47801620
C430		4822 124 80582	ELECT. 4700 µF 16V RA2	OA47801620
C431		4822 122 30043	CER. 0.01 µF +80%-20% 50V	DK18103310
C432		4822 122 30043	CER. 0.01 µF +80%-20% 50V	DK18103310
C***			**P401-CAPACITORS (COMMON)** HIGH DIELECTRIC CONSTANT CERAMIC CAPACITOR, 50V: C433,C434	
			P401-RESISTORS	
R413		4822 111 20411	150Ω ± 1% 1/4W	NR01151140
R414		4822 111 20411	150Ω ± 1% 1/4W	NR01151140
R415		4822 111 20409	12Ω ± 1% 1/4W	NR01120140
R416		4822 111 20409	12Ω ± 1% 1/4W	NR01120140
R429		4822 111 20418	82KΩ ± 1% 1/4W	NR01823140
R430		4822 111 20418	82KΩ ± 1% 1/4W	NR01823140
R431		4822 111 20417	6.8KΩ ± 1% 1/4W	NR01682140
R432		4822 111 20417	6.8KΩ ± 1% 1/4W	NR01682140
▲R437		4822 052 10229	22Ω ± 5% 1/6W	GG05220160
▲R438		4822 052 10229	22Ω ± 5% 1/6W	GG05220160
R439		4822 050 21021	100Ω ± 5% 1/4W	GG05101140
R440		4822 050 21021	100Ω ± 5% 1/4W	GG05101140
R***			**P401-RESISTORS (COMMON)** CARBON FILM FIXED RESISTOR, ±5% 1/6W: R401~R412, R417~R428, R433~R436	
			P401-SEMICONDUCTORS	
D401 § D414		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
Q401 § Q404		4822 130 43547	F.E.T. 2SK369 V VGDS-40V PD0.4W	HF203691V0
Q405 § Q408		4822 130 42949	TRS. 2SA970 (GR OR BL)	HT109702A0
Q409 § Q412		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q413		4822 209 73064	IC NJM-2068-DD	HC10053090
			P401-MISCELLANEOUS	
J401		4822 290 81598	TERMINAL, 2P RCA JACK GOLD	YT02021130
L401	/02	4822 156 11019	CHOKE COIL 320 MH	LC13240010
L402	/02	4822 156 11019	CHOKE COIL 320 MH	LC13240010
S401		4822 276 13409	PUSH SWITCH PUSH SW SPUP19-4N-W2.0	SP04010660
			P501-MASTER VOL. CIRCUIT BOARD	
			P501-CAPACITORS	
C501			FILM 330 PF ± 5%	OF15331540
C502			FILM 330 PF ± 5%	OF15331540
C503		4822 121 42759	FILM 0.22 µF ± 5% 50V	OF15224010
C504		4822 121 42759	FILM 0.22 µF ± 5% 50V	OF15224010

POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
C505 § C508		4822 123 30089	MICA 22 PF ± 5% 500V FE	DF35220520
C509		4822 124 80578	ELECT. 22 µF 25V ARA	OA22602550
C510		4822 124 80578	ELECT. 22 µF 25V ARA	OA22602550
C511 § C514		4822 124 22277	ELECT. 470 µF 16V ± 20%	OA47701620
C515		4822 124 23112	ELECT. 10 µF 16V	EQ10601630
			P501-RESISTORS	
R505		4822 111 20413	220Ω ± 1% 1/4W	NR01221140
R506		4822 111 20413	220Ω ± 1% 1/4W	NR01221140
R519		4822 111 20414	2.2KΩ ± 1% 1/4W	NR01222140
R520		4822 111 20414	2.2KΩ ± 1% 1/4W	NR01222140
▲R525		4822 052 10229	22Ω ± 5% 1/6W	GG05220160
▲R526		4822 052 10229	22Ω ± 5% 1/6W	GG05220160
R527		4822 101 11362	VARIABLE 10K X2 2K X2 RK27114MC	RY01030040
R***			**P501-RESISTORS (COMMON)** CARBON FILM FIXED RESISTOR, ±5% 1/6W: R501~R504, R507~R518, R521~R524	
			P501-SEMICONDUCTORS	
Q501		4822 209 90615	IC, NEW HDAM	KH243J1010
Q502		4822 209 90615	IC, NEW HDAM	KH243J1010
Q503		5322 130 41844	F.E.T. 2SK170 V	HF201701H0
Q504		5322 130 41844	F.E.T. 2SK170 V	HF201701H0
Q505		4822 130 62649	F.E.T. 2SJ74 V	HF100741H0
Q506		4822 130 62649	F.E.T. 2SJ74 V	HF100741H0
			P501-MISCELLANEOUS	
L501		4822 158 60605	FERRITE BEADS	FC90050060
L502		4822 158 60605	FERRITE BEADS	FC90050060
L503		4822 158 60605	FERRITE BEADS	FC90050060
			P551-TONE AMP CIRCUIT BOARD	
			P551-CAPACITORS	
C551		4822 124 22571	ELECT. 10 µF 50V	OA10605020
C552		4822 124 22571	ELECT. 10 µF 50V	OA10605020
C553			FILM 330 PF ± 5%	OF15331540
C554			FILM 330 PF ± 5%	OF15331540
C557		4822 121 70543	FILM 100 PF ± 5% 100V APSV	OF15101540
C558		4822 121 70543	FILM 100 PF ± 5% 100V APSV	OF15101540
C559		4822 124 22571	ELECT. 10 µF 50V	OA10605020
C560		4822 124 22571	ELECT. 10 µF 50V	OA10605020
C561		4822 124 22274	ELECT. 4.7 µF 50V	OA47505020
C562		4822 124 22274	ELECT. 4.7 µF 50V	OA47505020
C563		4822 121 42764	FILM 0.047 µF ± 5% 50V	OF15473010
C564		4822 121 42764	FILM 0.047 µF ± 5% 50V	OF15473010
C565		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C566		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C567		4822 121 70543	FILM 100 PF ± 5% 100V APSV	OF15101540
C568		4822 121 70543	FILM 100 PF ± 5% 100V APSV	OF15101540
C569		4822 124 22277	ELECT. 470 µF 16V	OA47701620
C570		4822 124 22277	ELECT. 470 µF 16V	OA47701620
C571		4822 124 90364	ELECT. 220 µF 16V	OA22701620
C572		4822 124 90364	ELECT. 220 µF 16V	OA22701620
			P551-RESISTORS	
▲R563		4822 052 10229	22Ω ± 5% 1/8W	GG05220160
▲R564		4822 052 10229	22Ω ± 5% 1/8W	GG05220160
▲R575		4822 052 10229	22Ω ± 5% 1/8W	GG05220160
▲R576		4822 052 10229	22Ω ± 5% 1/8W	GG05220160
R577		4822 101 30735	VARIABLE 10KΩ X2 (B)	RM01030720
R578		4822 101 30735	VARIABLE 10KΩ X2 (B)	RM01030720
R579		4822 100 30138	VARIABLE 100KΩ MN FOR BALANCE VOLUME	RM01041310
R***			**P551-RESISTORS (COMMON)** CARBON FILM FIXED RESISTOR ±5% 1/6W: R551~R562, R565~R574	
			P551-SEMICONDUCTORS	
Q551		4822 209 83163	IC LM833	HC10020360
Q552		4822 209 83163	IC LM833	HC10020360
Q553		4822 209 73064	IC NJM-2068-DD	HC10053090
Q554		4822 209 73064	IC NJM-2068-DD	HC10053090

[VERS.:VERSION, U:U.S.A, F:Japan, K:Far East, /XX:Europe]

POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
			P551-MISCELLANEOUS	
S551		4822 276 13065	PUSH SWITCH SPUP24V1A STROK=2MM,NON-SHORT	SP04010650
			P601-POWER AMP L CIRCUIT BOARD	
			P601-CAPACITORS	
C601			FILM 330 PF ± 5%	OF15331540
C602		4822 121 42759	FILM 0.22 µF ± 5% 50V	OF15224010
C603		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C604		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C605		4822 121 70437	FILM 1000 PF ± 5% 100V	OF15102540
C606		4822 124 80578	ELECT. 22 µF 25V ARA	OA22602550
C607			ELECT. 470 µF 63V ARD	OA47706330
C608			ELECT. 470 µF 63V ARD	OA47706330
C609		4822 124 80542	ELECT 10 µF 63V RBPA	EQ10606390
C610		4822 124 80542	ELECT 10 µF 63V RBPA	EQ10606390
C611		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C612			MICA 33PF ± 5% 500V FE	DF35330520
			P601-RESISTORS	
R609		4822 111 20412	1.5KΩ ± 1% 1/4W	NR01152140
R610		4822 111 20424	24KΩ ± 1% 1/4W	NR01243140
R611		4822 111 20419	10KΩ ± 1% 1/4W	NR01103140
R612		4822 111 20419	10KΩ ± 1% 1/4W	NR01103140
R613			3.3KΩ ± 1% 1/4W	NR01332140
R614			3.3KΩ ± 1% 1/4W	NR01332140
R620		4822 101 30707	TRIMMING 2.2KΩ VERT	RA02220760
R621		4822 052 10101	100Ω ± 5% 1/6W	GG05101160
R622		4822 052 10101	100Ω ± 5% 1/6W	GG05101160
R623		4822 050 22209	22Ω ± 5% 1/4W	GG05220140
R624		4822 050 22209	22Ω ± 5% 1/4W	GG05220140
R625		4822 052 10331	330Ω ± 5% 1/4W	GG05331140
R626		4822 052 10331	330Ω ± 5% 1/4W	GG05331140
R627		4822 050 26809	68Ω ± 5% 1/6W	GG05680160
R628		4822 050 26809	68Ω ± 5% 1/6W	GG05680160
R629		4822 050 26809	68Ω ± 5% 1/4W	GG05680140
R630		4822 050 26809	68Ω ± 5% 1/4W	GG05680140
R631		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
R632		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
⚠R633		4822 117 12061	0.1Ω ± 5% 5W BWR5	GW05001050
⚠R634		4822 117 12061	0.1Ω ± 5% 5W BWR5	GW05001050
R635		4822 050 22262	2.2KΩ ± 5% 1/4W	GG05222140
R636		4822 050 21022	1KΩ ± 5% 1/4W	GG05102140
R638		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
			P601-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R601~608, R615~R619, R637	
			P601-SEMICONDUCTORS	
D601		4822 130 33713	ZENER DIODE HZ15L-3 400MW	HD30052010
D602		4822 130 33713	ZENER DIODE HZ15L-3 400MW	HD30052010
D603 S		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
D606				
D607 S		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
D610				
D611		4822 130 80272	ZENER DIODE 7.5V MTZJ7.5C	HD30751000
D612		4822 130 80272	ZENER DIODE 7.5V MTZJ7.5C	HD30751000
D613		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
D614		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
Q601		4822 209 12922	IC OPA604AP BB	HC10005610
Q603		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q604		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q605		4822 130 62335	TRS. 2SD2033(E) 120V 1.8W	HT420331E0
Q606		4822 130 62334	TRS. 2SB1353(E) 120V 1.8W	HT213531E0
Q607		4822 130 42949	TRS. 2SA970 (GR OR BL)	HT109702A0
Q608		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q609		4822 130 62334	TRS. 2SB1353(E) 120V 1.8W	HT213531E0
Q610		4822 130 62335	TRS. 2SD2033(E) 120V 1.8W	HT420331E0
Q611		4822 130 43283	TRS. 2SC2705 (O OR Y) TAPING	HT327052A0
Q612		4822 130 42999	TRS. 2SA1145 (O OR Y) TAPING	HT111452A0
Q613		4822 130 63635	TRS. 2SC4793 (O,Y)	HT347932A0
Q614		4822 130 63634	TRS. 2SA1837 (O,Y)	HT118372A0
Q615		4822 130 43303	TRS. 2SC2922 (Y,P)	HT329222B0
Q616		4822 130 43015	TRS. 2SA1216 (Y,P)	HT112162B0
			P651-SENSOR L CIRCUIT BOARD	
			P651-SEMICONDUCTOR	
Q602		4822 130 60526	TRS. 2SD1508 DARLINGTON HFE>4000	HT415080A0
			P701-POWER AMP R CIRCUIT BOARD	
			P701-CAPACITORS	
C701			FILM 330 PF ± 5%	OF15331540
C702		4822 121 42759	FILM 0.22 µF ± 5% 50V	OF15224010
C703		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C704		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C705		4822 121 70437	FILM 1000 PF ± 5% 100V	OF15102540
C706		4822 124 80578	ELECT. 22 µF 25V ARA	OA22602550
C707			ELECT. 470 µF 63V ARD	OA47706330
C708			ELECT. 470 µF 63V ARD	OA47706330
C709		4822 124 80542	ELECT 10 µF 63V RBPA	EQ10606390
C710		4822 124 80542	ELECT 10 µF 63V RBPA	EQ10606390
C711		4822 121 42754	FILM 0.010 µF ± 5% 50V	OF15103010
C712			MICA 33 PF ± 5% 500V FE	DF35330520
			P701-RESISTORS	
R709		4822 111 20412	1.5KΩ ± 1% 1/4W	NR01152140
R710		4822 111 20424	24KΩ ± 1% 1/4W	NR01243140
R711		4822 111 20419	10KΩ ± 1% 1/4W	NR01103140
R712		4822 111 20419	10KΩ ± 1% 1/4W	NR01103140
R713			3.3KΩ ± 1% 1/4W	NR01332140
R714			3.3KΩ ± 1% 1/4W	NR01332140
R720		4822 101 30707	TRIMMING 2.2KΩ VERT	RA02220760
R721		4822 052 10101	100Ω ± 5% 1/6W	GG05101160
R722		4822 052 10101	100Ω ± 5% 1/6W	GG05101160
R723		4822 050 22209	22Ω ± 5% 1/4W	GG05220140
R724		4822 050 22209	22Ω ± 5% 1/4W	GG05220140
R725		4822 052 10331	330Ω ± 5% 1/4W	GG05331140
R726		4822 052 10331	330Ω ± 5% 1/4W	GG05331140
R727		4822 050 26809	68Ω ± 5% 1/6W	GG05680160
R728		4822 050 26809	68Ω ± 5% 1/6W	GG05680160
R729		4822 050 26809	68Ω ± 5% 1/4W	GG05680140
R730		4822 050 26809	68Ω ± 5% 1/4W	GG05680140
R731		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
R732		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
⚠R733		4822 117 12061	0.1Ω ± 5% 5W BWR5	GW05001050
⚠R734		4822 117 12061	0.1Ω ± 5% 5W BWR5	GW05001050
R735		4822 050 22262	2.2KΩ ± 5% 1/4W	GG05222140
R736		4822 050 21022	1KΩ ± 5% 1/4W	GG05102140
R738		4822 052 10109	10Ω ± 5% 1/6W	GG05100160
			P701-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R701~R708, R715~R719, R737	
			P701-SEMICONDUCTORS	
D701		4822 130 33713	ZENER DIODE HZ15L-3 400MW	HD30052010
D702		4822 130 33713	ZENER DIODE HZ15L-3 400MW	HD30052010
D703 S		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
D706				
D707 S		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
D710				
D711		4822 130 80272	ZENER DIODE 7.5V MTZJ7.5C	HD30751000
D712		4822 130 80272	ZENER DIODE 7.5V MTZJ7.5C	HD30751000
D713		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
D714		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
Q701		4822 209 12922	IC OPA604AP BB	HC10005610
Q703		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q704		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q705		4822 130 62335	TRS. 2SD2033(E) 120V 1.8W	HT420331E0
Q706		4822 130 62334	TRS. 2SB1353(E) 120V 1.8W	HT213531E0
Q707		4822 130 42949	TRS. 2SA970 (GR OR BL)	HT109702A0
Q708		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q709		4822 130 62334	TRS. 2SB1353(E) 120V 1.8W	HT213531E0
Q710		4822 130 62335	TRS. 2SD2033(E) 120V 1.8W	HT420331E0
Q711		4822 130 43283	TRS. 2SC2705 (O OR Y)	HT327052A0

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POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
Q712		4822 130 42999	TRS. 2SA1145 (O OR Y)	HT111452A0
Q713		4822 130 63635	TRS. 2SC4793 (O,Y)	HT347932A0
Q714		4822 130 63634	TRS. 2SA1837 (O,Y)	HT118372A0
Q715		4822 130 43303	TRS. 2SC2922 (Y,P)	HT329222B0
Q716		4822 130 43015	TRS. 2SA1216 (Y,P)	HT112162B0
			P751-SENSOR R CIRCUIT BOARD	
			P751-SEMICONDUCTOR	
Q702		4822 130 60526	TRS. 2SD1508 DARLINGTON HFE>4000	HT415080A0
			P801-POWER SUPPLY CIRCUIT BOARD	
			P801-CAPACITORS	
▲C801				
≶			ELECT 4700 µF 25V ALD	OB47802510
▲C804				
C805		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C806		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C807		4822 124 22039	ELECT. 220 µF 16V ARA	OA22701650
C808		4822 124 22039	ELECT. 220 µF 16V ARA	OA22701650
			P801-RESISTORS	
▲R801		4822 050 21108	1Ω ±5% 1/2W	GG05010120
▲R802		4822 050 21108	1Ω ±5% 1/2W	GG05010120
▲R811		4822 050 24708	4.7Ω ±5% 1/4W	GG05047140
▲R812		4822 050 24708	4.7Ω ±5% 1/4W	GG05047140
			P801-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R803~,R810,	
			P801-SEMICONDUCTORS	
▲D801				
≶		4822 130 80839	DIODE S5688G VRM=400V I0=1A	HD20029050
▲D808				
D809		4822 130 32862	ZENER DIODE HZ7C-2L	HD30059010
D810		4822 130 32862	ZENER DIODE HZ7C-2L	HD30059010
▲Q801		4822 130 10175	F.E.T. MOS FET 2SK2013	HF22013100
▲Q802		4822 130 10176	F.E.T. MOS FET 2SJ313	HF10313100
Q803		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q804		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q805		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q806		4822 130 42949	TRS. 2SA970 (GR OR BL)	HT109702A0
			P801-MISCELLANEOUS	
▲G801		4822 121 20263	COMP. 0.47 µF +6.8Ω NOISE KILLER	BF47400010
			P851-POWER SUPPLY CIRCUIT BOARD	
			P851-CAPACITORS	
▲C851		4822 124 23649	ELECT. 470 µF 25V	OA47702520
C853		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C854		4822 124 41535	ELECT. 100 µF 25V	OA10702520
C855		4822 121 42861	FILM 0.001 µF ±5% 50V	OF15102010
C856		4822 124 22696	ELECT. 3.3 µF 50V	OA33505020
C857		4822 124 21903	ELECT 1 µF 50V BP	EQ10505030
C858		4822 121 42754	FILM 0.010 µF ±5% 50V	OF15103010
C859		4822 126 12453	CER. 0.01 µF +80%-20% E 500V	DK18103560
C860		4822 122 30043	CER. 0.01 µF +80%-20% 50V	DK18103310
▲C861				
≶			ELECT. 470 µF 63V ARD	OA47706330
▲C864				
C865		4822 124 41536	ELECT. 100 µF ±20% 35V	OA10703520
C866		4822 124 41536	ELECT. 100 µF ±20% 35V	OA10703520
C867		4822 121 42861	FILM 0.001 µF ±5% 50V	OF15102010
			P851-RESISTORS	
▲R851		4822 117 10158	1Ω ±5% 1/4W	GG05010140
▲R855		4822 117 10158	1Ω ±5% 1/4W	GG05010140
▲R856		4822 117 10158	1Ω ±5% 1/4W	GG05010140
▲R858		4822 116 60264	39Ω ±5% 1W	GA05390010
▲R859		4822 116 60264	39Ω ±5% 1W	GA05390010
▲R867		4822 117 10158	1Ω ±5% 1/4W	GG05010140
R868		4822 052 10101	100Ω ±5% 1/6W	GG05101160
R869		4822 052 10101	100Ω ±5% 1/6W	GG05101160
▲R870		4822 050 21108	1Ω ±5% 1/2W	GG05010120

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▲R871		4822 050 21108	1Ω ±5% 1/2W	GG05010120
			P851-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R852~R854, R857, R860~R866	
			P851-SEMICONDUCTORS	
▲D851				
≶		4822 130 80839	DIODE S5688G VRM=400V I0=1A	HD20029050
▲D854				
D855		4822 130 31253	ZENER DIODE HZ2CLL 2.4V ZENNER (± 02.V)	HD30067010
▲D857				
≶		4822 130 80839	DIODE S5688G VRM=400V I0=1A	HD20029050
▲D860				
D861		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
▲D862				
≶		4822 130 80839	DIODE S5688G VRM=400V I0=1A	HD20029050
▲D869				
D870		4822 130 33713	ZENER DIODE HZ15L-3 400MW	HD30052010
▲D891		4822 130 50315	DIODE S10VB-20 10A 200V	HE20014290
▲Q851		4822 130 63292	TRS. 2SD1417	HT41417100
Q852		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q853		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q854		4822 130 42682	DIG.TRS DTA144ES	BA10010210
Q855		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
▲Q856		4822 130 63292	TRS. 2SD1417	HT41417100
Q857		4822 130 42835	F.E.T. 2SK246 (GR)	HF202461C0
Q858		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
			P851-MISCELLANEOUS	
▲G851		4822 121 20263	COMP. 0.47 µF +6.8Ω NOISE KILLER	BF47400010
L851		4822 158 60605	FERRITE BEADS	FC90050060
			P891-RECTIFIER DIODE CIRCUIT BOARD	
			P891-SEMICONDUCTOR	
▲D891		4822 130 50315	DIODE S10VB-20 10A 200V	HE20014290
			P891-MISCELLANEOUS	
▲G891		4822 121 20263	COMP. 0.47 µF +6.8Ω NOISE KILLER	BF47400010
			P901-SPK PROTECTOR CIRCUIT BOARD	
			P901-CAPACITORS	
C901		4822 124 22273	ELECT. 0.47 µF 50V	OA47405020
C902		4822 121 42754	FILM 0.010 µF ±5% 50V	OF15103010
C903				
≶		4822 121 43136	FILM 0.068 µF ±5% 50V	OF15683010
C906				
C907		4822 121 42754	FILM 0.010 µF ±5% 50V	OF15103010
C908		4822 124 22698	ELECT. 47 µF 25V	OA47602520
C909		4822 122 40617	CER. 0.1 µF +80%-20%	DD38104010
C910		4822 124 22698	ELECT. 47 µF 25V	OA47602520
C911		4822 124 22273	ELECT. 0.47 µF 50V	OA47405020
C912		4822 124 22571	ELECT. 10 µF 50V	OA10605020
C913		4822 124 22571	ELECT. 10 µF 50V	OA10605020
C914	/02	4822 121 51388	FILM 0.027 µF ±5% 50V YM1-92G	OF15273010
C915	/02	4822 121 51388	FILM 0.027 µF ±5% 50V YM1-92G	OF15273010
			P901-RESISTORS	
R909		4822 050 22209	22Ω ±5% 1/4W	GG05220140
R910		4822 050 22209	22Ω ±5% 1/4W	GG05220140
R911		4822 053 10109	10Ω ±5% 1W	GA05100010
R912		4822 053 10109	10Ω ±5% 1W	GA05100010
R913		4822 053 10331	330Ω ±5% 1W	GA05331010
R914		4822 053 10331	330Ω ±5% 1W	GA05331010
			P901-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RESISTOR, ±5% 1/6W: R901~R908, R915~R925	

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POS. NO.	VERS. COLOR	PART NO. (For EUROPE)	DESCRIPTION	PART NO. (For U/K/F)
			P901-SEMICONDUCTORS	
D901 thru D904		4822 130 80837	DIODE HSS81TD 150V 150MA	HD20027010
D905		4822 130 32362	DIODE 1SS176,MA165,1SS254 30V 0.1A	HD20002000
Q901		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q902		4822 130 43233	TRS. 2SC2240 (GR OR BL)	HT322402A0
Q903		4822 130 42949	TRS. 2SA970 (GR OR BL)	HT109702A0
Q904		4822 130 61439	TRS. 2SB1237 (R)	HT212371C0
Q905		4822 209 83312	IC TA7317P	HC10042050
			P901-MISCELLANEOUS	
J901		4822 263 21093	TERMINAL, SPK TERMINAL, X8	YT01080140
⚠L901		4822 280 70354	RELAY 24MBU-510 5A/240VAC	LY20240310
L902		4822 280 10295	RELAY G5-2-H1 24V RELAY	LY20240450
L903		4822 157 52453	COIL 0.5 µH 1.6PEW 12MM-D 7-1/2T	LJ31115080
L904		4822 157 52453	COIL 0.5 µH 1.6PEW 12MM-D 7-1/2T	LJ31115080
L905		4822 158 60605	FERRITE BEADS	FC90050060
L906		4822 158 60605	FERRITE BEADS	FC90050060
L907		4822 158 60605	FERRITE BEADS	FC90050060
			P951-POWER SW CIRCUIT BOARD	
			P951-CAPACITOR	
⚠C951		4822 121 43732	FILM 0.01 µF 250V AC	DF77103500
			P951-MISCELLANEOUS	
⚠J951		4822 265 20359	PLUG CONNECTOR 2P B3P-VH	YP04000760
⚠S951		4822 276 12647	PUSH SWITCH SWITCH ESB-99753V-4 TV-8	SP01011470
			P981-ACOUTLET CIRCUIT BOARD	
			P951-MISCELLANEOUS	
⚠F981	F		FUSE 250V 10A GRU MITI	FS11000570
⚠F981	/02	4822 253 30199	FUSE T4A 250V BS LISTED	FS10400850